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# ISOLATION AND SPECIATION OF CANDIDA SPECIES FROM VARIOUS CLINICAL SPECIMENS IN A TERTIARY CARE HOSPITAL OF NAVI MUMBAI

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## ABSTRACT

**Background:** Candida is one of the most frequently encountered opportunistic fungi that cause severe infection in humans. Incidence of candidiasis is increasing worldwide. Species identification of candida is important as non-albicans candidas is increasing in number and are more resistant to antifungal drugs.

**Aim & Objectives:** The aim and objective of the study was to find out the frequency of Candida from various clinical specimens (sputum, urine, stool, pus, high vaginal swab, throat swab, nail clippings, skin scraping, ET tube) and their speciation.
Material & Method: A total 100 Candida species were isolated from various clinical specimens were included in this study. Speciation of candida was done by germ tube, carbohydrate fermentation & assimilation test, colony colour on Hichrom Candida agar and microscopic morphology on corn meal agar.

**Results:** Out of total 1150 clinical samples, 100 candida species were isolated, thus the incidence of 8.7%. Non-albicans candida predominated (56%) over Candida albicans (44%). In both the sexes maximum patients belongs to age group >70 years and females were affected more than males.

**Conclusion:** Hichrom Candida agar is useful for primary isolation & differentiation of candida species. Incidence of candidiasis is 8.7% of which incidence of non-albicans candida was more than candida albicans. Females were affected more than male.

**KEYWORDS:** Candida; Isolation; Speciation; Hichrom Candida agar.

## INTRODUCTION:

The incidence of infection caused by Candida spp. has increased steadily over the last two decades, and Candida albicans remains the most common fungal pathogen isolated from clinical samples. [1, 2] Numerous records have documented the increased incidence of non-albicans species among hospitalized and immunosuppressed patients. [3] Candidiasis represents 80% of human fungal infections and most of the cutaneous, oropharyngeal & particularly vulvovaginal infections. The occurrence of chronic disease such as cancer, diabetes & cardiopathies, together with the lifestyle changes of the general population in major urban centers, constitute other reasons for increase in Candidiasis. Recently an increase in other species including C. tropicalis, C. glabrata, C. krusei & C. parapsilosis was recorded. C. glabrata has become a prominent pathogen in some institutions. [4] Candida albicans and non-albicans species are closely related but differ from each other with respect to epidemiology, virulence characteristics and antifungal susceptibility. All Candida species have been shown to cause a similar spectrum of disease ranging from oral thrush to invasive disease, yet differences in disease severity and susceptibility to different antifungal agents have been reported. [2]

## MATERIALS & METHODS:

Specimens were collected from OPD/IPD of MGM Medical College Hospital, Navi Mumbai. Microscopic examination was done. Speciation of Candida was done by standard procedure. Specimens were inoculated on Sabouraud's dextrose agar (SDA) & incubated at 37ºC for 48 hours. Growth was then processed for gram staining. Gram positive budding yeast cells with or without pseudohyphae were considered as Candida species. Speciation of Candida was done by germ tube test, carbohydrate fermentation & assimilation test, colony colour on Hichrom Candida agar and microscopic morphology on corn meal agar.

## RESULTS:

In the present study, the incidence of was 8.7% in various clinical specimens. Incidence of Non-albicans candida (56%) was more than Candida albicans (44%). Among non-albicans species, C. tropicalis was 30% followed by C. glabrata 17% C. krusei 7% and C. gulliermondii 2% were the major isolates. Most of the isolates were from female (54%) as compared to male (46%) patients. Females were affected more than male. Maximum number of Candida isolates were from the age group >61 years. Maximum number of Candida isolates was from urine, followed by sputum, stool, HVS, Throat swabs and Nail clippings. Candida albicans was the major isolate from sputum. Candida tropicalis, Candida glabrata & Candida krusei was the major isolates from urine. Maximum Candida isolates were from medicine followed by urology, surgery, paediatric, gynaecology & dermatology.

**Table 1: Appearance of Candida species on Hichrom Candida agar.**

| S.N | Candida Species | Colonies appearance of Candida species |
|---|---|---|
| 1. | Candida albicans | Light green coloured smooth colonies |
| 2. | C. glabrata | Cream to white smooth colonies |
| 3. | C. krusei | Purple fuzzy colonies |
| 4. | C. tropicalis | Blue to metallic blue coloured raised colonies |
| 5. | C. gulliermondii | Cream to white smooth colonies |


**Figure 1: Appearance of Candida species on Hichrom Candida agar.**

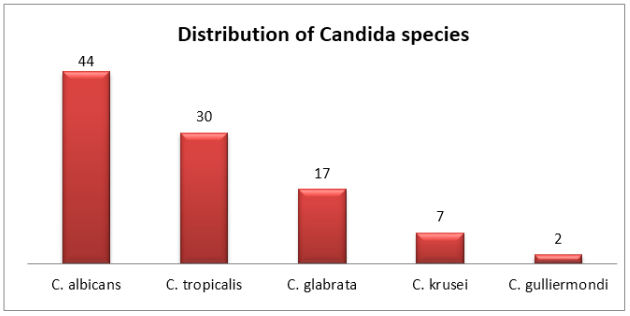


**Figure 2: Distribution of Candida species in clinical specimens.**

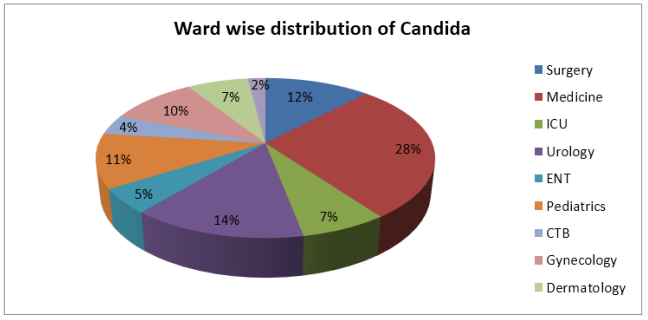


**Figure 3: Ward wise distribution of Candida.**

## DISCUSSION:

In the present study, prevalence of candidiasis was 8.7% in various clinical specimens. NAC (56%) was isolated at higher rates than Candida albicans (44%) which correlates with reports by other workers Vijaya D et al.[5] showed 46% C. albicans isolates, Grace et al.[6] showed 43.15% C. albicans, Prasad et al.[7] showed 47.6% C. albicans. and Sachin C. Deorukhkar et al.[8] showed 39.2% C. albicans.

In our study most common species isolated was C. albicans 44% followed by C. tropicalis 30%, C. glabrata 17%, C. krusei 7% and C. gulliermondii 2%. Similar observation was documented by Dasari Sarada et al.[9], Sachin C. Deorukhkar et al.[8] and C A Kauffman et al.[10] In the study by Sachin C. Deorukhkar et al.[8] out of 523 Candida spp. isolated from various clinical specimens, 192 (36.7%) were C. albicans and 331 (63.3%) were NAC spp. Among the NAC spp., C. tropicalis (35.1%) followed by C. glabrata (28.1%) and C. krusei (16.3%) was the major isolates, which is comparable with our study.

In our study majority of candida spp. was isolated from HVS 21.1%, followed by urine 12.2%, sputum 10%, nail clippings 9.4%, stool 8.9% and throat swab 8.6%. Of these >50 % of urinary candida isolates belongs to NAC spp. Our observation is similar to that of F Alvarez-Lerma et al.[11] and C A Kauffmann et al.[10], where >50% of urinary Candida isolates belonged to NAC spp.

In the present study, most of the candida isolates was found to be higher in female patients 54 (54%) as compared to male patients 46 (46%) patients with male to female ratio of 0.85:1. This correlates with Amar C S et al.[12] who isolated Candida species more from female 62 (60.2%) than male 41 (39.8%) patients in ratio of (M: F) 0.66:1. Our study differed from R A Kashid et al.[13] who reported the isolation of Candida species was higher in males 81 (55.10%) as compared to females 66 (44.8%) with male to female ratio of 1:0.81.

We observed that the frequent isolation of Candida species was in the age group above 60 years (34%) which was similar with the study of R A Kashid et al.[13] who reported highest incidence in the age group above 60 years (24.48%). Candida species remain the most important cause of opportunistic infections worldwide, affecting predominantly patients over 65 years old, Aikaterini Flevari et al.[14]

In the present study, Hichrome agar Candida identified all Candida albicans, C. tropicalis, C. glabrata, C. krusei and Candida gulliermondii which correctly correlates with study by Willinger B et al. [15], Momani OM et al.[16] and Gultekin et al.[17].

## CONCLUSION:

Incidence of candidiasis is 8.7% in various clinical samples and the incidence of non albicans candida was more than Candida albicans. Maximum number of Candida isolates was from urine, followed by sputum, stool, HVS & throat swab. Females were affected more than male. Maximum number of Candida isolates was from old age group. Maximum numbers of Candida isolates was from medicine followed by urology, surgery, paediatrics, gynaecology & dermatology unit. There is an increase in the prevalence of non-albicans candida. Prevalence of candida was found to be higher in patients associated with predisposing factors. The advantages of Hichrom candida agar are that it is easy to prepare, it facilitates the rapid isolation and identification of clinically important candida species and it potentially decreases laboratory cost.

## REFERENCES:

1. Pfaller, M. A., and D. J. Diekema. Epidemiology of invasive candidiasis: a persistent public health problem. Clin. Microbiol. 2007; Rev. 20:133–163.
2. Shao, P. L., L. M. Huang, and P. R. Hsueh. Recent advances and challenges in the treatment of invasive fungal infections. Int. J. Antimicrob. Agents. 2007; 30:487–495.
3. Shaheen MA, Taha M. Species identification of Candida isolates obtained from oral lesions of hospitalized and non-hospitalized patients with oral candidiasis. Egyptian Dermatology Online Journal 2006; 2 (1).
4. Osmanagaoglu O, Altinlar N, Sacilik C et al. Identification of different Candida species isolated in various hospitals in Ankara by fungi chrome test kit and their differentiation by SDS-PAGE. Turk J Med Sci 2000; 30: 355-358.
5. Vijaya D et al. Candida speciation using chrom agar. Journal of clinical and diagnostic research. 2011; August, Vol 5(4): 755-757.
6. Grace L, Tan, Ellena M Peterson. CHROM agar candida medium for direct susceptibility testing of yeast from blood culture . J Clin Microbiol 2005;43:4:1727-1731
7. Prasad KN, Agarwal J, Dixit AK, Tiwani DP, Dhole TN. Role of

yeasts as nosocomial pathogens & their susceptibility to fluconozole & amphotericin B. Indian J Med Res 1999;110:11-17. Sachin C. Deorukhkar

8. et al. Non-albicans Candida Infection: An Emerging Threat. Interdisciplinary Perspectives on Infectious Diseases Volume 2014, Article ID 615958: 7.
9. Dasari sarada et al. Isolation and speciation of candida from clinical samples in a tertiary care hospital at kurnool, andhrapradesh, india. Journal of evolution of medical and dental sciences. 2014; vol. 3, issue 73, december 25; page: 15431-15436.
10. C. A. Kauffman, "Candiduria," Clinical Infectious Diseases, vol. 41, supplement 6, pp. S371–S376, 2005.
11. F. Alvarez-Lerma, J. Nolla-Salas, C. León et al., "Candiduria in critically ill patients admitted to intensive care medical units," Intensive Care Medicine, vol. 29, no. 7, pp. 1069–1076, 2003.
12. Amar cs et al. Study of prevalence and antifungal susceptibility of candida. Int j pharm bio sci 2013; apr; 4(2): (b) 361 – 381.
13. Ragini Ananth Kashid et al. Characterisation and antifungal susceptibilty testing for candida species in a tertiary care hospital. Journal of Health Sciences and Research, Volume 2, Number 2, August 2011.
14. Aikaterini Flevari et al. Treatment of invasive candidiasis in the elderly: a review. Clinical Interventions in Aging 2013:8 1199–1208.
15. Willinger B et al. Evaluation of chromagar candida for rapid screening of clinical specimens for candida species. Mycoses, 1999; 42 (1-2).
16. Momani Om, et.al. Cost effectiveness and efficacy of Chrom agar candida medium in clinical specimen. East Mditerr Health J, 2000; 6 (5-6).
17. Gultekin B. et al. Distribution of candida species in vaginal specimen and evaluation of Chrom agar candida. Mikrobiyol Bul 2005; 39 (3): 319-24.